

Exr's Amelts.

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What is claimed is:

1 1. A carbon nanocapsule supported catalyst~~§~~,
2 comprising at least one kind of catalytic metal particle
3 deposited on the carbon nanocapsule, wherein the carbon
4 nanocapsule has the following formula: $F(-M)_n$, in which F
5 is the carbon nanocapsule, M is the catalytic metal
6 particle, and n is the number of the catalytic metal
7 particle.

1 2. The carbon nanocapsule supported catalyst~~§~~ as
2 claimed in claim 1, wherein the carbon nanocapsule is a
3 polyhedral carbon cluster constituted by having a
4 concentric multi-layers of closed graphitic sheet
5 structure, and the diameter of the carbon nanocapsule is
6 3-100 nm.

1 3. The carbon nanocapsule supported catalyst~~§~~ as
2 claimed in claim 1, wherein the carbon nanocapsule is
3 hollow.

1 4. The carbon nanocapsule supported catalyst~~§~~ as
2 claimed in claim 1, wherein the carbon nanocapsule is a
3 metal-filled carbon nanocapsule filled with metals, metal
4 oxides, metal carbides, or alloys.

1 5. The carbon nanocapsule supported catalyst~~§~~ as
2 claimed in claim 1, wherein n is 1-20.

1 6. The carbon nanocapsule supported catalyst~~§~~ as
2 claimed in claim 1, wherein the catalytic metal particle

3 is a nanocluster, substantially constituting metal atoms,
4 able to catalyze chemical reactions.

1 7. The carbon nanocapsule supported catalyst~~s~~ as
2 claimed in claim 6, wherein the catalytic metal particle
3 is a nanocluster constituting metals, metal oxides, metal
4 carbides, metal nitrides, metal sulfides, alloys or
5 combinations thereof.

1 8. The carbon nanocapsule supported catalyst~~s~~ as
2 claimed in claim 7, wherein the catalytic metal particle
3 is a nanocluster constituting Pt, Pd, Rh, Cu, Fe, Co, Ni,
4 Au, Ru, Zn, Ti, Os, Mo, or Ag.

1 9. The carbon nanocapsule supported catalyst~~s~~ as
2 claimed in claim 1, wherein the catalytic metal particle
3 is an organic metal particle.

1 10. The carbon nanocapsule supported catalyst~~s~~ as
2 claimed in claim 9, wherein the catalytic metal particle
3 is $\text{PtCl}_2(\text{NH}_2)_2$ or ferrocene.

1 11. The carbon nanocapsule supported catalyst~~s~~ as
2 claimed in claim 1, wherein the catalytic metal particle
3 M is deposited at a corner of the outermost graphite
4 layer of the polyhedral carbon nanocapsules.

1 12. The carbon nanocapsule supported catalyst~~s~~ as
2 claimed in claim 11, wherein the catalytic metal particle
3 M is attach to those functional groups which were
4 selective modified at the corners.

1 13. The carbon nanocapsule supported catalyst~~s~~ as
2 claimed in claim 1, wherein the diameter of the catalytic
3 metal particle is 1-20nm.

1 14. A carbon nanocapsule supported catalyst~~s~~,
2 comprising at least one kind of catalytic metal particle,
3 with a diameter of 1-20nm, deposited at a corner of the
4 outermost graphite layer of the carbon nanocapsule,
5 wherein the carbon nanocapsule has the following formula:
6 $F(-M)_n$, in which F is the carbon nanocapsule, M is the
7 catalytic metal particle, and n, the number of the
8 catalytic metal particle, is 1-20.

1 15. The carbon nanocapsule supported catalyst~~s~~ as
2 claimed in claim 14, wherein the carbon nanocapsule is a
3 polyhedral carbon cluster constituted by having
4 concentric multi-layers of closed graphitic sheet
5 structure, and the diameter of the carbon nanocapsule is
6 about 3-100 nm.

1 16. The carbon nanocapsule supported catalyst~~s~~ as
2 claimed in claim 14, wherein the carbon nanocapsule is
3 hollow.

1 17. The carbon nanocapsule supported catalyst~~s~~ as
2 claimed in claim 14, wherein the carbon nanocapsule is a
3 metal-filled carbon nanocapsule filled with metals, metal
4 oxides, metal carbides, or alloys.

1 18. The carbon nanocapsule supported catalyst~~s~~ as
2 claimed in claim 14, wherein the catalytic metal particle

3 is a nanocluster, substantially constituting metal atoms,
4 able to catalyze chemical reactions.

1 19. The carbon nanocapsule ^{supported catalyst} ~~catalyst support~~ as
2 claimed in claim 18, wherein the catalytic metal particle
3 is a nanocluster constituting metals, metal oxides, metal
4 carbides, metal nitrides, metal sulfides, alloys or
5 combinations thereof.

1 20. The carbon nanocapsule supported catalyst~~s~~ as
2 claimed in claim 19, wherein the catalytic metal particle
3 is a nanocluster constituting Pt, Pd, Rh, Cu, Fe, Co, Ni,
4 Au, Ru, Zn, Ti, Os, Mo, or Ag.

1 21. The carbon nanocapsule supported catalyst~~s~~ as
2 claimed in claim 14, wherein the catalytic metal particle
3 is an organic metal particle.

1 22. The carbon nanocapsule supported catalyst~~s~~ as
2 claimed in claim 21, wherein the catalytic metal particle
3 is $\text{PtCl}_2(\text{NH}_2)_2$ or ferrocene.